



# ECON241

## Introductory Econometrics

S2 Evening 2015

*Dept of Economics*

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## General Information

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Credit points

3

Prerequisites

15cp including [(STAT170 or STAT171 or PSY122) and (ECON110 or ECON111)]

Corequisites

Co-badged status

Unit description

This unit introduces some basic econometric techniques employed by economists in the analysis of economic relationships. These techniques are also used extensively in marketing and finance. In addition to its role as a basis for programs of study in economics, marketing and finance, the unit is the foundation econometric unit for students who wish to undertake a program of study in applied econometrics. Topics covered will usually include: estimation and hypothesis testing; simple and multiple regression; prediction; the interpretation and evaluation of regression models, including an elementary discussion of nonlinear modelling, heteroscedasticity, auto-correlation, multicollinearity and specification error; and the use of categorical or qualitative data in regression models. Emphasis throughout the unit is on the application of econometric techniques and the interpretation of estimated results rather than formal theoretical proofs and derivations.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

Understand the key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.

Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.

Explain, compare and contrast these concepts, and apply them to an empirical analysis.

Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.

Understand how to use and interpret dummy variables in regression analysis.

Acquire familiarity with an econometric software program.

## Assessment Tasks

Name	Weighting	Due
<a href="#">Tutorial Exercises</a>	10%	Week 4,6,11,12 and 13.
<a href="#">Homeworks</a>	20%	Week 5, 9,11 and 13
<a href="#">Major Assignment</a>	20%	Week 10, Friday 4pm.
<a href="#">Final Examination</a>	50%	Exam period

## Tutorial Exercises

Due: **Week 4,6,11,12 and 13.**

Weighting: **10%**

Tutorials begin in week 2. Five out of 12 tutorials will be assessed and counted for your final grade. The assessable tutorials will be held in weeks 4, 6, 11,12 and 13 and they are worth 10% (2% each) for your final grade. In each tutorial class, students will be given a set of exercises based on the work recently covered in lectures. The answers to the questions must be submitted prior to the end of the class. Students may attempt the exercises up to **two times** during the class. Students are permitted to consult reference material, and to discuss the questions with the tutor and with other students but not to copy other student's work. The tutorial

questions and solutions will be published during the week following each class. Since we need to provide each enrolled student with a working computer, students are only permitted to attend the class in which they are registered. The tutorial exercises require a total of approximately 10 hours of work. Students are required to attend assessable tutorial classes. Students who do not submit an assessable tutorial exercise in class will be awarded a mark of zero for that particular exercise and will not be permitted to attempt it for credit at a later date. In cases where a student submits a satisfactory Disruption to studies application, explaining their non-attendance at a minimum of 3 tutorial classes, and if the student's prior attendance and performance is satisfactory, the weighting of that student's tutorial component will be adjusted accordingly.

Students must bring their Macquarie University campus card to each tutorial and display it in the holder provided. Failure to display a campus card may result in a student being refused access to the tutorial.

On successful completion you will be able to:

- Understand the key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Understand how to use and interpret dummy variables in regression analysis.
- Acquire familiarity with an econometric software program.

## Homeworks

Due: **Week 5, 9, 11 and 13**

Weighting: **20%**

Students will be given four homework exercises each worth 5% of the final grade (20% in total). It is intended that students will work on the homework exercises independently. The homework exercises are due in weeks 5, 9, 11 and 13 and must be submitted via the iLearn system. The exercises must be submitted online prior to the due date and time. Each exercise may be submitted up to **two times** prior to the deadline and each attempt has a time limit of **two hours**.

Only the **final submission** will be marked. Each homework exercise will require approximately 2 hours of work. A few days after the submission of a homework exercise, students will be provided with their mark via the iLearn system. Students who do not submit a homework exercise will be awarded a mark of zero for that exercise. Students who have clearly colluded will be awarded a mark of zero, will not be permitted to resubmit, and may be reported to the

University Disciplinary Committee for further action. No extensions will be granted. In cases in which a student submits a satisfactory Disruption to Studies application, which documents incapacitation for at least 3 consecutive days, and if the student has a satisfactory record of attendance and performance in the previous assessment tasks, the weighting of that student's homework component will be adjusted accordingly.

Late homework and tutorial submissions will not be accepted. At the time of the submission deadline, the mark recorded for the final submission by each student for that homework task will be recorded. The homework task will remain accessible to students for revision, but the results of any subsequent attempts will not be used in the calculation of the grade. The only exception to this rule will be students who apply for, and are granted, Disruption to Studies.

On successful completion you will be able to:

- Understand the key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Acquire familiarity with an econometric software program.

## Major Assignment

Due: **Week 10, Friday 4pm.**

Weighting: **20%**

The assignment is due in week 10, 4pm Friday 16 October. The assignment assesses the understanding of the topics covered in lectures up to the submission deadline and is worth 20% of the final grade. Students must submit both a hard copy and an electronic copy of their assignment. The hardcopy must be submitted to the Business and Economics Student Services (BESS, E4B106) and the electronic copy must be through iLearn. Instructions and information about the requirements of the assignment will be provided in class and on iLearn. Students who have clearly colluded will be awarded a mark of zero, will not be permitted to resubmit, and may be reported to the University Disciplinary Committee for further action. Late assignments will have a deduction of 20% of the total available marks made from the total awarded marks for each 24 hour period or part thereof that the submission is late (for example, 25 hours late in submission - 40% penalty) except for cases in which an application for Disruption to Studies has been made and approved.

On successful completion you will be able to:

- Understand the key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand how to use and interpret dummy variables in regression analysis.
- Acquire familiarity with an econometric software program.

## Final Examination

Due: **Exam period**

Weighting: **50%**

A two hour final examination for this unit will be held during the University examination period. You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable will be available in draft form approximately eight weeks before the commencement of the examinations and in final form approximately four weeks before the commencement of the examinations. The draft and final timetables will be available from <http://www.timetables.mq.edu.au/exam>.

Students who do not sit for the final exam will be awarded a grade of FA (failed absent). The only exception for this rule will occur in cases where the student has been granted Disruption to Studies on the grounds of unavoidable disruption. Students who are prevented from sitting the final exam due to illness or unavoidable disruption may wish to consider applying for Disruption to Studies. Information about unavoidable disruption is available at [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html). If a supplementary examination is granted as a result of the Disruption to Studies process the examination will be scheduled for after the conclusion of the official examination period. If the student does not attend the supplementary examination at the scheduled time, a grade of FA will be awarded

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, the final day of the official examination period.

On successful completion you will be able to:

- Understand the key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.

- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Understand how to use and interpret dummy variables in regression analysis.

## Delivery and Resources

### Classes

§ There is a single two-hour lecture each week of semester. There is also a tutorial class held in each week, beginning in week 2.

§ The timetable for classes can be found on the University web site at: <http://www.timetables.mq.edu.au/>

§ Two lecture streams are offered. Students should attend one of these lecture streams.

§ Students must register in a tutorial class during the first two weeks of semester. After this time, class changes will not be permitted. It is vital that students are available to attend the tutorial class at their registered time. Because of resource constraints, and the fact that five out of 12 tutorial work is assessable, students will not generally be permitted to attend a tutorial class other than the one in which they are registered.

§ It will be assumed that students regularly attend lectures.

§ Students are also required to attend all tutorial classes.

### Required and Recommended texts and/or materials

§ Hill, C. H., Griffiths, W. E. and Lim, G. C. (2011) *Principles of Econometrics* (4th ed.) Wiley. This is the main text used in the unit. It is strongly recommended that students purchase a copy. It may be purchased from the Macquarie University Co-op Bookshop. It is also available in the library. Additional useful textbooks.

Gujarati, D.N., and Porter, D.C. (2010) *Essentials of Econometrics* (4th ed.) McGraw-Hill.

Stock, J.H., and Watson, M.W. (2007) *Introduction to Econometrics* (2nd ed.) Addison-Wesley

§ Adkins, L. C. (2010) *Using Gretl for Principles of Econometrics* (3<sup>rd</sup> ed.). This book is a free download from <http://www.learneconometrics.com/gretl/ebook.pdf>.

A list of prescribed reading will be developed on the website as the unit progresses.

§ Students should download the Gretl datasets from <http://www.learneconometrics.com/gretl.html>. These are the datasets used in examples and exercises in the above two books.

### Technology Used and Required

§ The main software package used in ECON241 is Gretl (<http://gretl.sourceforge.net/>). This



software is available for use in the E4B computer labs, and may be freely downloaded for use elsewhere. The Microsoft Windows version is available at <http://gretl.sourceforge.net/win32/>. A Mac version is available at <http://gretl.sourceforge.net/osx.html>. Linux users should check their repositories or download the rpm or source from <http://gretl.sourceforge.net/>.

§ The use of a spreadsheet will often be helpful for tasks in this unit. For students who don't own or wish to use Microsoft Excel, a free alternative is provided by OpenOffice (<http://www.openoffice.org>).

§ Significant use is made of online material in ECON241. The unit material has been designed for the (free) Firefox web browser (<http://www.mozilla.com/en-US/firefox/upgrade.html>). Other browsers may display the unit material properly, but this cannot be guaranteed.

### **Unit web page**

§ Course material is available on the learning management system (iLearn).

§ Students are strongly advised to check the unit web page regularly for new material and announcements.

## **Unit Schedule**

The unit is taught by lectures, tutorials, homework exercises and quizzes.

Students are expected to attend all lectures and to read the specified references after the relevant lecture. They are required to attend five assessable tutorials out of 12 tutorials. Students should download the datasets that are used in the textbook and work through all the relevant examples in chapters. Students should submit the tutorials, homework exercises and quizzes and reflect on the feedback provided.

### Approximate Schedule of Topics

Week	Topics
1	Introduction, Review of necessary mathematics.
2	Probability
3	Probability
4	Inference
5	Simple regression
6	Simple regression



7	Prediction, goodness of fit and modelling issues
8	Multiple regression
9	Multiple regression
<b>10</b>	Heteroscedasticity
11	Dynamics and Autocorrelation
12	Dynamics and Autocorrelation
13	Exam review

### Schedule of work submission

Weeks	Tutorial	Homework Exercises	Assignment
1			
2			
3			
4	Tutorial 3		
5		Exercise 1	
6	Tutorial 5		
7			
8			
9		Exercise 2	
10			Assignment
11	Tutorial 10	Exercise 3	
12	Tutorial11		
13	Tutorial 12	Exercise 4	

## Learning and Teaching Activities

### Lectures

There is a single two-hour lecture each week of semester. Two lecture streams are run in parallel – a day stream and an evening stream. Students should attend one of the two streams. •The timetable for classes can be found on the University web site at:

<http://www.timetables.mq.edu.au/>

### Tutorials

•Students must enrol in a tutorial class during the first two weeks of semester. After this time, class changes will not be permitted. It is important that students are available to attend the tutorial class at their enrolled time. Because of resource constraints, and the fact that five out of the twelve tutorial work is assessable, students will not generally be permitted to attend a tutorial class other than the one in which they are enrolled.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Grievance Management Policy [http://mq.edu.au/policy/docs/grievance\\_management/policy.html](http://mq.edu.au/policy/docs/grievance_management/policy.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your

student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](#).

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

## IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students.

## Graduate Capabilities

### Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

### Learning outcome

- Acquire familiarity with an econometric software program.

### Assessment tasks

- Tutorial Exercises

- Homeworks
- Major Assignment

## Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

### Learning outcomes

- Understand the key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Understand how to use and interpret dummy variables in regression analysis.
- Acquire familiarity with an econometric software program.

### Assessment tasks

- Tutorial Exercises
- Homeworks
- Major Assignment
- Final Examination

## Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

## Learning outcomes

- Understand the key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Understand how to use and interpret dummy variables in regression analysis.
- Acquire familiarity with an econometric software program.

## Assessment tasks

- Homeworks
- Major Assignment

## Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

## Learning outcomes

- Understand the key statistical concepts, including probability distributions, parameters and estimators, the sampling distribution of an estimator, point and interval estimation, and hypothesis testing.
- Specify and estimate a regression model. Summarise and interpret the estimation results, and draw valid inferences utilising hypothesis tests. Appreciate the relevance and limitations of the econometric methods used.
- Explain, compare and contrast these concepts, and apply them to an empirical analysis.
- Understand the assumptions of a classical (or standard) regression model and the consequences of violation of the assumptions.
- Understand how to use and interpret dummy variables in regression analysis.
- Acquire familiarity with an econometric software program.

## Assessment tasks

- Tutorial Exercises
- Homeworks
- Major Assignment
- Final Examination

## Research and Practice

- This unit uses research from both internal and external sources.
- This unit gives students practice in applying research findings in tutorials and homework exercises.